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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/667.605	09/23/2003	Bernd Karl Appelt	4459-130	9744

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LOWE HAUPTMAN GILMAN & BERNER, LLP  
Suite 310  
1700 Diagonal Road  
Alexandria, VA 22314

EXAMINER

NADAV, ORI

ART UNIT PAPER NUMBER

2811

DATE MAILED: 06/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<b>Application No.</b> 10/667,605	<b>Applicant(s)</b> APPELT ET AL.	
	<b>Examiner</b> Ori Nadav	<b>Art Unit</b> 2811	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 April 2006.
- 2a) ☒ This action is FINAL.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 10-14, 20-22, 24 and 26-35 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-14, 20-22, 24 and 26-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 26 April 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 10-14 and 26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claimed limitations of a window mounted directly on the optical element of the chip by said transparent adhesive layer which is disposed between said window and said optical element, as recited in claim 10, are unclear as to whether the window is mounted directly on the optical element of the chip (i.e. the window is in direct contact with the optical element), or a transparent adhesive layer is disposed between said window and said optical element.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which the subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 10-12, 14, 20-22, 24, 26-28, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. (6,266,197) to in view of Boon et al. (2004/0041221A1).

Regarding claims 10 and 20, Glenn et al. teach in figure 2 and related text an optical semiconductor package comprising:

- a substrate 102 having opposite upper and lower surfaces;

- a chip 106 having an optical element and disposed on the upper surface;

- a plurality of bonding pads 104, 104A disposed on the upper surface;

- a plurality of bonding wires 114 electrically connecting the chip 106 to the bonding pads;

- a window 122 made of a transparent material (column 11, lines 5-10),

- a support 226 supporting the window for positioning the window corresponding to the optical element of the chip 106,

Note that a window made of a transparent material for allowing light to transmit through the window and interact with the optical element is a functional language and does not further limit or define the structure and is not given any patentable weight. Additionally, the device taught by Glenn et al. could have been used for the claimed purpose.

Glenn et al. do not teach an encapsulant formed on the substrate, encapsulating the chip and the bonding wires, for fixing the window and for hermetically fixing the support on the substrate.

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Boon et al. teach in figure 4 and related text an encapsulant 32 formed on the substrate, encapsulating the chip 22, for fixing the window 6 and for hermetically fixing the support 2 on the substrate.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an encapsulant formed on the substrate, encapsulating the chip and the bonding wires, for fixing the window and for hermetically fixing the support on the substrate in Glenn et al. in order to provide better protection to the chip.

Regarding the claimed limitations of a window mounted directly on the optical element of the chip by said transparent adhesive layer which is disposed between said window and said optical element, prior art's device includes an encapsulant, wherein the part of the encapsulant which is located between said window and said optical element is said transparent adhesive layer. Therefore, prior art's device includes a window mounted directly on the optical element of the chip by said transparent adhesive layer which is disposed between said window and said optical element, s claimed.

Regarding claim 11 and 21, the claimed limitations of "encapsulant is formed by means of an overmolding process" are process limitations, which does not carry weight in claim drawn to structure, because distinct structure is not necessarily formed. A product by process claim directed to the product per se, no matter how actually made, In re Hirao, 190 USPQ 15 at 17 (footnote 3). See In re Fessman, 180 USPQ 324, 326 (CCPA 1974); In re Marosi et al., 218 USPQ 289, 292 (Fed. Cir. 1983); and particularly In re Thorpe, 227 USPQ 964, 966 (Fed. Cir. 1985), all of which make it clear that it is the

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patentability of the final structure of the product “gleaned” from the process steps, which must be determined in a “product by process” claim, and not the patentability of the process. See also MPEP 2113. Moreover, an old and obvious product produced by a new method is not a patentable product, whether claimed in “product by process” claims or not.

Regarding claim 12, Glenn et al. teach a ledge (portion of 226) for securing the window in the encapsulant of prior art’s device.

Regarding claims 14 and 24, Glenn et al. teach in figure 12 and related text the window is a lens 1104.

Regarding claim 20, prior art’s device includes at least a portion of the encapsulant is formed directly on the substrate.

Regarding claim 22, Glenn et al. teach the window is hermetically disposed on the support 226.

Regarding claims 26 and 28, Glenn et al. teach the optical element comprises an optical sensor 106.

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Regarding claim 27, the transparent adhesive layer in prior art's device is the part of the encapsulant which is located between said window and said optical element.

Therefore, prior art teaches a transparent adhesive layer directly, physically contacts both the lower surface of said window and an upper surface of said optical sensor of said chip and attaches the lower surface of said window and the upper surface of said optical sensor together; and said encapsulant surrounds said window and directly, physically contacts the side surface of said window (the right surface side of the window of Glenn et al.), while leaving the upper surface of said window exposed from an upper surface of said encapsulant.

Claims 13 and 32-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Boon et al., as applied to claim 10 above, and further in view of Adams (4,732,042).

Glenn et al. and Boon et al. teach substantially the entire claimed structure, as applied to claims 10 and 27 above except teaching an encapsulant made of an opaque material.

Adams teaches an encapsulant 19 is made of an opaque material (column 3, line 40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an encapsulant made of an opaque material in the device of Glenn et al. and Boon et al., in order to provide better protection to light sensitive circuits of the device.

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Claims 29, 31 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. in view of Okada et al. (4,838,089).

Regarding claim 29, Glenn et al. teach substantially the entire claimed structure, as applied to claim 20 above, including

a supporting wall 226 extending upwardly from the upper surface of the substrate 12;

a window made of transparent material and supported by the supporting wall at a location above the optical sensor for allowing light to transmit through the window and interact with the optical element

Glenn et al. do not teach an encapsulant formed on the upper surface of the substrate to surround the supporting wall.

Okada et al. teach in figure 3 and related text an encapsulant 36 formed on the upper surface of the substrate to surround supporting wall 28.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an encapsulant on the upper surface of the substrate to surround the supporting wall in Glenn et al.'s device in order to provide better protection to the device.

Regarding claim 31, the combined device shows the encapsulant, the supporting wall, the window and the substrate together define a hermetically sealed cavity in which the chip, the optical sensor and the wires are disposed.



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Regarding claim 35, Glenn et al. teach a supporting wall comprises:

a first section extending upwardly from the upper surface of said substrate and inwardly toward the window, said first section having opposite upper and lower ends, the lower end being on the upper surface of said substrate;

a second section extending inwardly from the upper end of the first section, said second section supporting thereon said window (the second section is located above and below the window); and

a third section extending upwardly from the lower end of said first section and outwardly away from the window (the third section is the left part of supporting wall whose left side is vertical to the substrate 102, and that part extends upwardly from the lower end of said first section and outwardly away from the window), said third section being embedded in said encapsulant (in the combined device);

wherein said first and third sections define together a cavity receiving therein a portion of said encapsulant.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Glenn et al. and Okada et al., as applied to claim 29 above, and further in view of Boon et al. Glenn et al. and Okada et al. teach substantially the entire claimed structure, as applied to claim 29 above, including an encapsulant includes an outer portion covering an outer side surface of the supporting wall, but except a transparent encapsulant encapsulating the chip.

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Boon et al. teach in figure 4 and related text an inner transparent portion 32 encapsulating the chip 22.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use an inner portion encapsulating the chip and the wires and covering an inner side surface of the supporting wall, wherein the inner portion of the encapsulant is transparent, in the device of Glenn et al. and Okada et al., in order to provide better protection to the chip.

***Allowable Subject Matter***

Claim 34 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: The prior art of record does not teach or suggest, singularly or in combination at least the limitation of a light path does not extend through said encapsulant.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Response to Arguments***

Applicant argues that the window 122 of Glenn is not mounted on the sensor chip 106, because the window 122 of Glenn is mounted over chip 106.

There is no structural difference between the phrase a window is mounted on the chip, and a window is mounted over the chip. The terms "on", "over" and "above", are synonymous when considering the claimed invention, because office personnel are to give claims their broadest reasonable interpretation in light of the supporting disclosure. See, e.g., *In re Zletz*, 893 F.2d 319, 321 - 22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989) ("During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow . . .")

Applicant argues that Glen's ledge 226 is not located at the claimed window.

Glen's ledge 226 is located above and below the claimed window 122.

Therefore, Glen teaches a ledge located at the claimed window.

Applicant argues that Boon et al. fail to disclose in figure 4 that at least a portion of the encapsulant is formed directly on the substrate.

Prior art's device is formed by encapsulating Glenn et al.'s device, as taught by Boon et al. Forming an encapsulant in Glenn et al.'s device would inherently include an encapsulant being in directly with the substrate 102 (see figure 2 of Glenn et al.).

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Applicant argues that Okada et al. do not teach an optical sensor but a pressure sensor.

Okada et al. was not cited to teach an optical sensor. Glenn et al. teach an optical sensor. Okada et al. was cited to teach an encapsulant 36 formed on the upper surface of the substrate to surround supporting wall 28.

Applicant argues that it would not have been obvious to incorporate the window of Glenn et al. into the device taught by Okada et al. as suggested by the examiner.

The examiner did not suggest to incorporate the window of Glenn et al. into the device taught by Okada et al. The examiner suggested that the encapsulant of Okada et al. would be incorporated into the device of Glenn et al.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the


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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ori Nadav whose telephone number is 571-272-1660. The examiner can normally be reached between the hours of 7 AM to 4 PM (Eastern Standard Time) Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'Ori Nadav', written in a cursive style.

O.N.  
6/20/06

ORI NADAV  
PRIMARY EXAMINER  
TECHNOLOGY CENTER 2800